

Patent Claims

- Sub B1
1. Polyethylene molding material having a bimodal molecular weight distribution which has an overall density of $\geq 0.948 \text{ g/cm}^3$ and an $\text{MFI}_{190/5}$ of $\leq 0.2 \text{ dg/min}$, characterized in that it comprises an amount of from 35 to 65% by weight of low-molecular-weight ethylene homopolymer A which has a viscosity number VN_A in the range from 40 to 90 cm^3/g , a melt flow index $\text{MFI}_{190/2.16 A}$ in the range from 40 to 2000 dg/min and a density d_A of $\geq 0.965 \text{ g/cm}^3$, and an amount of from 35 to 65% by weight of high-molecular-weight ethylene copolymer B which has a viscosity number VN_B in the range from 500 to 2000 cm^3/g , a melt flow index $\text{MFI}_{190/5 B}$ in the range from 0.02 to 0.2 dg/min and a density d_B in the range from 0.922 to 0.944 g/cm^3 , and in that the fraction obtained during a preparative TREF analysis at a temperature of $78^\circ\text{C} \pm 3 \text{ K}$ using p-xylene has an average molecular weight of $\geq 200,000 \text{ g/mol}$.
 2. Pipe produced from a polyethylene molding material according to Claim 1, characterized in that it has a stress cracking resistance of $\geq 1500 \text{ h}$ and a fracture toughness FT of $\geq 9 \text{ mJ/mm}^2$.
 3. Pipe according to Claim 2, characterized in that it has a flexural creep modulus, measured in accordance with DIN 54852-Z4, of $\geq 1350 \text{ N/mm}^2$.
 4. Pipe according to Claim 2 or 3, characterized in that it has been produced from an ethylene polymer having a bimodal molecular weight distribution which comprises comonomers having from 4 to 10 carbon atoms in an amount of from 2.5 to 4% by weight in the relatively high-molecular-weight fraction B.
 5. Pipe according to Claim 3 or 4, characterized in that the low-molecular-weight fraction of the ethylene polymer has a melt flow index $\text{MFI}_{2.16/190^\circ\text{C}}$ in the range
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from 200 to 800 g/10 min, preferably from 250 to 450 g/10 min.

6. Pipe according to one of Claims 3 to 5, characterized in that the ethylene polymer has a melt flow index $MFI_{5/190^{\circ}C}$ of ≤ 0.19 dg/min.

7. Pipe according to one of Claims 2 to 6, characterized in that it has a notched impact strength NIS_{ISO} , measured in accordance with ISO 179 (DIN 53453), of at least 25 mJ/mm^2 at $-20^{\circ}C$ and of at least 40 mJ/mm^2 at $+23^{\circ}C$.

8. Pipe according to one of Claims 2 to 7, characterized in that it has a resistance to rapid crack growth, measured in accordance with ISO/DIS 13477 on a pipe in pressure class PN 10 having a diameter of 110 mm (S4 test), of ≥ 20 bar.

9. Use of a pipe according to one of Claims 2 to 8 for the transport of gases, in particular for the transport of natural gas.

10. Use of a pipe according to one of Claims 2 to 8 for the transport of water.

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